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THE LOG OF THE LAB

ISSUED NOW AND THEN BY THE MEMBERS OF
THE STAFF OF THE FOREST PRODUCTS LABO-
RATORY, FOREST SERVICE, MADISON, WISCONSIN
PRICE: A FRIENDLY INTEREST IN OUR WORK

The Now Number

March 1921

TEREDOS AND LIMNORIA

The *Cyrus Wakefield* once tied up to a California wharf which looked perfectly sound and trustworthy. During the night a rather strong offshore breeze sprang up, and the next morning the ship was sighted out in the bay, towing after her a large part of the quay. An investigation of the cause of the phenomenon showed that the supposedly solid wooden piles on which the wharf was built were nothing but thin shells of wood. The inside had been completely bored out. The tugging of the ship at her fastenings had snapped the piles off like pipestems. In another harbor a whole community of houses built upon one of the wharves was dumped without warning into the water. At another waterfront seven freight cars which had been run out on a solid-looking pier quite as unexpectedly sank out of sight in the bay.

Such are the dangerous pranks played by that marine borer, the teredo. The teredo is a worm with a hard shell auger for a head. He is in very fact the worm that turns. He may bore any size of hole up to one inch in diameter. When he is young he bores a very small hole, thus gaining entrance into a pile unnoticed. Once inside he grows rapidly, and can so completely honeycomb the pile in a few months that it will not support even its own weight. It is sometimes possible to hear the sound of his

◦ A SOAP BUBBLE TEST ◦

One way of telling whether a piece of oak belongs to the white oak or red oak group is to dip its end in soap suds and try blowing bubbles with it. If you succeed, the wood is red oak; if not, it is probably white oak. The pores of white oaks are plugged with a froth-like growth called *tyloses*, but those of red oak are very open.

Technical Note No. 125, "Identification of Oak Woods," which the laboratory sends on request, describes some less interesting methods of telling white oak from red oak lumber.

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The waist line on bushel baskets should be changed. Tests show that the center hoop on commercial baskets is too high to give the maximum strength.



THE LOG OF THE LAB IS
SMALL . . . IT WILL NOT
GROW BIGGER . . BECAUSE
¶ Paper is scarce, and then
you see ¶ The postman must
be able to carry it easily. Be-
sides ¶ A little pot is soon
hot, and then ¶ While the tall
maid is stooping, the little one
has swept the house. Another
thing, too ¶ A little leaven
leaveneth the whole lump.

bit when he is at work, but otherwise there is little outward sign of his presence.

Teredos are not always permitted to enjoy piling all to themselves. Frequently, while they are at work on the inside, other smaller marine borers called limnoria begin on the outside. Swarming upon the surface as thickly as 300 to the square inch, these little shell-headed borers in a short time literally eat the teredos out of house and home.

The problem of guarding the structures on our thousands of miles of waterfront against demolition by teredos and limnoria has stimulated a great deal of American inventive genius. Hundreds of schemes have been tried, from the rigging up of floats which scrape the sides of the piles with the rising and falling of the tide, to the dynamiting of harbors to destroy all animal life in their depths. One scheme which aroused much hope involved the use of a pile built up of several planks and therefore full of cracks. The supposition was that the teredo would not cross a crack; but, although the teredo may have had scruples in this matter, it soon became evident that the limnoria did not. The limnoria found the cracks a shelter instead of a barrier.

The Forest Products Laboratory has recently proposed a plan for the

study of the marine-borer problem covering the entire coastal waters of the United States. As the first unit of this immense program, it has just completed, with the aid of the American Wood Preserver's Association, a survey of the piling in San Francisco Bay. It is said that marine borers came into this bay clinging to the ships of the gold-rush days. At least the borers have been very active there ever since. In the last two years alone they have caused damage amounting to fifteen million dollars.

One of the facts clearly brought out in the recent piling survey is that of the diverse methods of protection which have been tried the most promising is that of treating the piles with creosote. Properly creosoted piles have remained unattacked for twenty-five years, while neighboring untreated piles lasted from six months to two years.

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WITH THE AID OF A JACK KNIFE AND A HAND LENS IT IS POSSIBLE TO IDENTIFY PRACTICALLY ALL THE NATIVE WOODS OF COMMERCIAL IMPORTANCE, BY EXAMINATION OF THE WOOD ALONE. . A SERIES OF LESSONS IN WOOD IDENTIFICATION IS IN PREPARATION BY THE FOREST PRODUCTS LABORATORY, AND WILL BE SENT AS ISSUED TO ANYONE INTERESTED.

A HUGE TESTING MACHINE

A machine for testing very large columns has just been erected at the Forest Products Laboratory. The new machine can exert a force of a million pounds and can crush a wooden post a foot square. Its jaws open to take in single timbers or assembled wooden structures thirty feet in height. A great range of testing speeds enables it to apply its tremendous load with the fatiguing slowness of a building settling on its foundation timbers or with the sudden shock of a train dashing on to a wooden trestle. Architects and engineers have very meager data of the kind which this machine can supply.

SAWDUST CATTLE FOOD

The second series of feeding experiments has been started by the Wisconsin College of Agriculture to try out further the hydrolized sawdust cattle food made at the Forest Products Laboratory. In a preliminary trial cows were fed for three months on a "one-quarter-sawdust ration," two pounds of the new food being substituted for a pound of barley. During this trial they not only kept on giving milk in the same abundance as before but even gained in weight. And the laboratory jingle has it that they didn't "pine for oats or barley" after tasting "the grain that's in the wood." Whether the

DECAY OF TIES, BY C. J. Humphrey, Forest Products Laboratory. Price \$2.00 published for the laboratory by the American Wood Preservers Association, Box 375, Madison, Wisconsin.

booklet. Although written primarily for the use of rail-

road tie producers and inspectors, it is well worth owning by anyone at all interested in the decay of wood. The facts are presented in an intelligible way, and the book contains many helpful illustrations. A number of the principal fungi are shown in their natural colors. The book is small, and has a durable

leatheroid cover, so it is a serviceable handbook. It is published for the laboratory by the American Wood Preservers Association, Box 375, Madison, Wisconsin.

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THE BOX MANUAL, which will be off the press in April, contains some fundamental facts about wooden box and crate construction which are equally indispensable in the packing of electric light globes or farm tractors. The book is being published for the laboratory by the National Association of Box Manufacturers.

cattle will eventually prefer their old diet or will continue to lick up the sawdust food in even greater proportions will be told in the new test.

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SO THAT YOU WON'T HAVE TO WADE THROUGH A FLOOD TO GET TO THE SPRING. . . WE HAVE BRIEFLY SUMMARIZED THE MOST WIDELY USABLE FACTS DISCOVERED IN OUR YEAR'S WORK AND HAVE PUT THEM IN ONE VOLUME: *TECHNICAL NOTES FOR 1920.*

THE PAPER ON WHICH THIS ISSUE OF THE LOG IS PRINTED was made on the laboratory experimental machine from southern pine and red gum. It represents a very promising effort to manufacture the southern pines into white paper under conditions which are economically feasible. Difficulties of pulping and bleaching have heretofore restricted the use of southern pine pulp chiefly to the manufacture of kraft or wrapping paper, but these difficulties can apparently be overcome without prohibitive expense or change in mill practice.

The reason that pine and red gum are used together in this paper is that book paper requires a long-fibered pulp to impart strength and a short-fibered soft pulp to give finish, opacity, and other printing qualities. Experiments indicate that either longleaf, shortleaf, or loblolly pine will

serve equally well as the long-fibered pulp. Red gum is only one of several short-fibered southern hardwoods which might be used in conjunction with the pines.

The pines and hardwoods are distributed throughout the South in proportions well suited to the manufacture of book paper, and the forests are near the centers of production of coal, chemicals, and other raw materials used in making paper.

The South is well adapted to become a constant source of pulpwood supply, for it is favored with a large annual growth of timber. In fact, although the bulk of the standing timber is in the West, the bulk of the annual growth of the entire country is now in the South. The southern forests could supply pulpwood enough for most of the book and magazine paper now used.

RIGHTING THE APPLE CART

The apple cart is always being upset on its way to market. Just now it is the particular type of bushel box, in which apple growers are accustomed to ship their fruit, that too often spills or severely bruises its contents before the destination is reached.

Recently some of the standard apple boxes, packed with fruit, were tested in the revolving box drum at the laboratory. Before they had gone a "journey" of average length in this machine, most of them had burst open, and the drum was dripping cider.

It was noticed that the parts of the boxes first to loosen and give way were the four nails holding each edge. Two more nails were therefore driven into the edges of the remaining boxes. *With this simple change the boxes stood twice as much rough handling.*

INADEQUATE
NAILING IS THE
CHIEF FAULT OF
MOST OF THE
BOXES EXAMINED
BY THE FOREST
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ADDITIONAL NAILS
WOULD SAVE THE
SHIPPERS OF THIS
COUNTRY MIL-
LIONS OF DOLLARS.